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ABSTRACT

Research treatments of home environment in studies of intellectual development and school performance are reviewed. The conceptualizations of home environment include variables specifying family status and deprivational conditions, child-rearing techniques, educational and intellectual process variables, and transactional experience. Psychological propositions are supported by evidence which progresses from gross, non-specific family status indices to fine measures of quantity and quality of time spent in caretaker-child transactions. Each conceptualization builds the knowledge social scientists have with respect to aspects of a child's experience that are alterable for optimizing expressions of intelligence and learning. Directions for future research suggest how the early home experience might be used to investigate early classroom experience. (Author/GDC)

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The Importance of Environment in Educational and Psychological Research

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To DQN and self-initiated experience

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ABSTRACT

A critical focus is given to treatments of home environment in studies of intellectual development and school performance. The conceptualizations of home environment include variables specifying family status and deprivational conditions, child-rearing techniques, educational and intellectual process variables, and transactional experience. Psychological propositions are supported by evidence which progresses from gross, non-specific family status indices to fine measures of quantity and quality of time spent in caretaker-child transactions. Each conceptualization builds the knowledge social scientists have with respect to aspects of a child's experience that are alterable for optimizing expressions of intelligence and learning. Directions for future research include how the early home experience might be used to investigate early classroom experience.

INTRODUCTION

The purpose of this paper is to focus critically on a portion of the empirical treatments given to the home environment in studies of intellectual development and school performance. It should be apparent, at the conclusion of this paper, that a considerable degree of research refinement is necessary if social scientists are to delimit the variables necessary for optimal use of the interface between our psychological knowledge of the home environment's impact on intellectual functioning and classroom practice. The first few sections of this paper present orienting remarks, psychological propositions and supporting evidence concerning the home environment's impact on intellectual development. The remaining sections speak to educational relevance and research needed to ascertain the impact this has in the classroom setting.

ORIENTING REMARKS

The limited view for psychological growth imposed by the heredity approach to intellectual development (Jensen, 1969), and the "no effects from schooling" arguments for educational development (Coleman, et al., 1966, Mayeske, et al., 1972), provide the impetus for this paper. Taken to the extreme, in an applied sense, both views relegate the role of the educational psychologist to a cost-efficiency expert. If heredity and family status are viewed as such potent predictors of academic achievement, then all that is needed is some cost-benefit function for the educational setting where all are educated at some minimal expense.

Environmentalists are not beyond reproach, however, with respect to

the amount and degree of knowledge we have on the actual role of environment on intellectual development. Wohlwill (1973) declared that social scientists have been "woefully unspecific" in their use of environment as a determinant of behavior. The term "environment" is described as a catchall to represent anything from "mere opportunity for the exercise of a motor response to the broad complex of forces operating in the child's familial, social and cultural milieu" (Wohlwill, pp. 90-91, 1973).

An equally important point made by Deutsch and associates (1967) provides an additional focus to this paper. The "effects of conditions of life" on the development of cognitive structures lie in the interaction of the home and the school. A careful study of the literature led Martin Deutsch (1967) to conclude that there is,

> no explanation or justification for any child with an intact brain, and who is not severely disturbed, not to learn all the basic scholastic skills. The failure of such children to learn is the failure of the schools to develop curricula consistent with the environmental experiences of the children and their subsequent initial abilities and disabilities (p. 69).

The development of comprehensive curricula might provide the necessary fodder for the long-awaited yield of some effects from schooling.

Various approaches to researching psychological and social variables found in the home environment exist in the vast literature of intellectual development and school performance. The findings from these approaches to empirical research on environment are presented as a series of developmental refinements. The evidence presented progresses from gross, nonspecific family status indices to fine measures of quantity and quality of time spent in caretaker-child transactions. As

social scientists refine conceptualizations of the home environment and early experience, we will be closer to optimizing early school learning experiences, through the correct combination of elements for successful manipulation of the environment for learning. This, in essence, is a slight modification of the educator's adage of which Hunt (1961) reminds us, "teaching must start where the learner is" (p. 268).

PROPOSITIONS

Thus, some general propositions or assumptions guided the accumulation of evidence that appears in this paper. The degree to which these propositions hold is an issue of their acceptance as valid. Indeed, the foundation for future research is constructed upon the dilution of evidence in support of the following propositions:

1. Social and psychological experiences are a critical influence in the development of intelligence, achievement and competence;

2. These experiences are cumulative; the degree to which the child learns to transact and operate on the environment is the degree to which intellectual development is fostered;

3. Restrictive, routine experiences are associated with a similar approach to learning, and hence expressions of intelligence; conversely active operation and manipulation of the environment provide a repertoire of novel experiences which expand intellectual expression;

4. The developing and changing environment has its greatest impact during the most rapid period of human development, negating the notion of rate of development as predetermined.

EVIDENCE IN SUPPORT OF CLAIMS THAT HOME ENVIRONMENT HAS AN IMPACT ON INTELLECTUAL DEVELOPMENT

Specification of family status variables has been a pervasive approach taken in the study of social variables and intellectual development. Family status variables are defined as those which reflect the social status of the parents, their occupational levels or similar measures which indicate a family's potential to contribute material resources to a child's education (Kifer, 1977). Deutsch (1973) adds that amount of formal education of the family's main wage-earner is related to occupation and is also independently related to socioeconomic status. The underlying notions of most social class measures remain as economic level and prestige attribution, producing an index of the family position in a status hierarchy (Lavin, 1965; Deutsch, 1973). As such, these background factors are principally indicative of what parents are, rather than what parents do to foster intellectual development in their children.

The findings within this area consistently indicate that educational level of parents and occupational status are positively related to children's intelligence test and school performance (Deutsch, 1973; Jones and DeBlassie, 1971; Little, et al., 1973; White, 1976). That is to say, children from higher socioeconomic strata score higher on intelligence tests and perform better in school. Similarly, a greater degree of parental education is associated with better intellectual performance on the part of the child. Beyond the positive relationship of parental SES and children's intelligence test performance, family size is negatively related to test performance, especially within lower class children (Clausen, 1966; Douglas, 1964; Kennett and Cropley, 1970; Marjoribanks,

et al., 1975, Nuttal, et al., 1976). This finding is, perhaps, best conceptualized as a decrement in available parental attention, as the number of children in the home increases. Expressed as the inverse of the number of siblings in the family, this variable is related to verbal, number and reading test performance (Marjoribanks, et al., 1975; Walberg and Marjoribanks, 1976). However, this relationship is attenuated in higher SES families.

Further definitional explanations of environment-intellect developmental relationships are evident through an integration of social class, race and deprivational level (Deutsch, 1967).* As a general environmental measure, deprivational level is an index of housing dilapidation, parental aspirations for the child, number of children in the home, conversational activity, cultural activity and kindergarten schooling experience. Within this framework, psycho-social environmental factors are viewed as depriving when at least two conditions are present: 1) when the factors are predominantly associated with particular social groups, such as those defined by SES and race; 2) when the factors are related to depressed performance, for example lowered academic achievement (Whiteman, et al., 1967). The emphasis, here, is on social patterning of the environmental conditions related to a psychological deficit. Thus, the social deprivation approach conceptualizes environment as a somewhat stable, consistent entity, where the relationship of social groups and certain environmental factors is not strictly biologically

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*A great portion of the research on psycho-social deprivation, school performance and intellectual development has been conducted by Cynthia and Martin Deutsch and their associates at the New York University Developmental Institute.

causal (genetically determined) but mediated by social conditions of poverty, unemployment and inequality of opportunity. However, social deprivation implies that the relationship between certain environmental factors and impaired performance is causal, to the extent that the environmental factors impede learning and performance. An environmental factor may be deprivational to one grouping of persons, e.g. according to social class, but not to another grouping, e.g. according to race. Furthermore, deprivation may occur with respect to certain constellations of performance rather than all types.

To adequately summarize the Deutsch portion of the deprivation literature, it is necessary to first focus on the associations of environment, race and SES. The first and fifth grade, Black and white children in these studies, lived and attended school in an urban setting. The relationship of environment, as defined by the Deprivation Index, and SES is stronger than environment and race (Bloom, et al., 1965). With respect to social class, the data indicate that lower class status, regardless of whether the child was Black or white, was associated with lower language scores. With respect to race, being Black was related to lower performance. However, the joint occurrence, of being lower class and Black, did not disproportionately associate with lower scores. In general, white and higher SES children scored higher on intellectual performance measures, and Black-white differences were greater for fifth grade children than for first graders (Deutsch, 1965; Deutsch and Brown, 1964; Whiteman and Deutsch, 1968; Whiteman, et al., 1967).

Children from highly deprived environments scored lower on performance measures and these scores were again lower for fifth graders than

for first graders. In addition, deprivation was shown to act as a factor independent of race and social class (Deutsch, 1965; Deutsch and Brown, 1964; Whiteman and Deutsch, 1968; Whiteman, et al., 1967). These deprivational influences obtained a greater influence on test scores, at a later developmental period, providing a notion of cumulative deficit. Moreover, race and social class contributed to the explanation of test performance variability dependent on the degree to which language was involved in the test.

Recent evidence contributed by Jensen (1977) provides further credence to the notion of cumulative deficit, discussed above. Age decrement was studied, in intelligence test performance of 1300 Black and white rural Georgia school children between the ages of five and eighteen and compared to a similar sample of California children. A significant age decrease in intelligence test performance was found for the Black Georgia sample. Blacks, in the California study, had a less disadvantaged social background and showed only a slight decrease in verbal intelligence test scores.

When home environment is conceptualized as an approach to child-rearing, in more of a traditional developmental psychology research mode, an amalgam of variables is specified. A portion of the findings specify quantity and quality of verbal achievement press elements in the child's environment and degree of access to such experiences fostering positive intellectual development in the child (Baumrind and Black, 1967; Bing, 1963; Hess and Shipman, 1965, 1968; Kagan and Moss, 1962; Pusser and McCandless, 1974; Richards and McCandless, 1972; Slaughter, 1970; Wachs, et al., 1971). Achievement press, quality of maternal verbal output,

general maternal involvement and provision of stimulating experiences are related to the child's verbal performance and intellectual development. Lower SES mothers generally did not provide as much verbal information through labeling of the environment and syntactic complexity and this reflected in their children's intellectual performance. Other studies specified parental behavioral modes and attitudes which fostered assertiveness, independence and trust and positive academic performance and intellectual curiosity in children (Burger, et al., 1975; Christopher, 1967; Kohn and Possman, 1973, 1974; Radin, 1971, 1972, 1973; Slaughter, 1970; Solomen, 1969; Swan and Stavros, 1973).

Home environments have also been studied from the process approach, principally associated with Bloom and his associates (1964). Here, the environment is defined as physical, social and intellectual forces, conditions and external stimuli which impinge upon the individual. Somewhere between the notion of total environment and specific interactions or single experiences is an approach to environment as a set of persisting forces which relate to the development of certain characteristics. Thus, within the subenvironments of the home, the process approach is used to define educational and intellectual activities, materials (resources), attitudes and aspirations provided by parents which foster educational achievement and intellectual development in their children. Semi-structured parental interviews and intellectual and academic testing of elementary school children were done in several independent investigations. The findings indicate a moderate to high correlation between the overall measurement of home intellectual environment and intelligence test performance and between the overall measurement

of home educational environment and educational achievement for children between nine and fourteen years of age (Davé, 1963; Walberg and Marjoribanks, 1973, 1974, 1976; Wolf, 1965). In addition, verbal and number abilities were most highly related to the home environment when compared to reasoning and spatial abilities. In these studies and others (Anderson and Johnson, 1971; Greenberg and Davidson, 1972; Henderson, 1972; Kifer, 1975; Trotman, 1977), above and beyond family status variables, such as parental occupational and educational level, environmental process measures accounted for a significant portion of achievement and ability variability. In addition, longitudinal process evidence provided by Hanson (1971) indicated that a good portion of changes in intelligence test scores were related to home environment. Finally, environment so measured, did not appear to have a greater impact for younger children.

The environmental domain as defined by Carew and her colleagues (Carew Watts, et al., 1973; White and Carew Watts, 1973; Carew, 1975a, 1975b, 1976) is perhaps the most articulated notion of environment we have with respect to intellectual development. In beginning the Harvard Pre-School Project, Carew Watts, Barnett and Halfar (1973) soberly noted that "there was not a single study in the literature in which the everyday experiences and environments of children in their crucial formative years were directly observed, objectively described and systematically related to their intellectual or social development" (p. 1). Thus, their interest was in the role played by everyday, normal cumulative encounters with people, places and things rather than extraordinary or traumatic occurrences, experimentally contrived or otherwise. The

precise definition which guided their measurement of home environment was:

> a set of human and non-human elements in the external world which are observably connected with the child's experience and which may affect his/her development of competence directly either through participating in a developmentally-pertinent experience, or by making such an experience more or less likely to occur or more or less pleasurable or likely to be repeated" (Carew, et al., 1973).

Thus, the instrumentation developed measured events that were: 1) highly intellectual activities, those likely to promote verbal, spatial, reasoning and expressive skills; 2) moderately intellectual activities, such as unstructured play with toys, household objects, living things, routine conversation; and 3) non-intellectual activities, such as basic care, gross motor and non-specific behavior. Five mother-child interactional techniques were also assessed at several time points: teaching; facilitation, routine talk; observation and restriction.

Carew (1975a) has further developed her conceptualization of environment by positing that the child coupled with the environment play a role in the creation of intellectually valuable experiences. An attempt was made to ascertain what the child did to determine his/her own environment, which creates experiences affecting intellectual development. These experiences are included in her research as empirical categories of "self-generated (child) expressions of competence and self-provided opoortunities for learning" or experience chiefly determined by other circumstances in the physical and social environment. As a total approach, Carew labels this modeling of environment and experience as "transactional." Transactions of child and environment are studied with respect

to experience and development. Thus, it is important to realize that embedded in this conceptualization of environment, there is at least a bi-directional model, with a child and environment exchange or transaction and at most an emergent view of environmental change and development. Whether or not this occurs with all children in all settings is an empirical question, yet to be posed formally.

The research approach taken was that of a "natural experiment." Forty children were studied in their natural settings of home and neighborhood across a 12 to 33 month age span. These children comprised two groups. One was expected to develop exceptionally well, intellectually, by age three, and the other group was expected to possess poor development by age three. Children were so identified with respect to determined intellectual competence of an older sibling. Additionally, subjects were identified as having middle class (professional) parents or working class (skilled or semi-skilled) parents.

Research findings indicate that when social class differences were controlled, persons interacting with children predicted to develop well were found to spend greater amounts of time in intellectually valuable activities. In addition, persons interacting with this same category of children spent greater amounts of time in active participation and overt encouragement (teaching) of intellectually valuable experiences. Persons interacting with children predicted to develop poorly spent greater amounts of time in participation and encouragement of social-physical activities (roughhousing and playfighting). Prior to two years of age, experiences provided to the child from the human environment were found to be more strongly related to age three IQ, than self (child) constructed

experiences. Not until age two and a half did the child's self-initiated competent behavior significantly correlate with IQ test performance at age three. In many ways, this is the most impactful and important finding. Dynamic or changing environments are very much an extension of the developing child's incorporation of operative skills from earlier experience with active, instructive aspects from the human environment. How these different transactive modes in children interact with classroom environmental presses and forces and the subsequent expressions of achievement remain to be specified.

RELEVANCE TO THE EDUCATIONAL SETTING

Few social scientists in the educational arena must be reminded of Coleman's (1966) conclusions,

> That schools bring little influence to bear upon a child's achievement that is independent of his [her] background and general social context; and that this very lack of independent effect means that the inequalities imposed upon children by their home, neighborhood, and peer environment are carried along to become the inequalities with which they confront adult life at the end of school. For equality of educational opportunity through schools must imply a strong effect of schools that is independent of the child's social environment, and that strong independent effect is not present in American schools (p. 325).

Specifically, these statements lead to a problem specified by Hunt (1961) several years prior to federally requested investigations of effects of schooling. Briefly stated, the notion of "match" is particular to the intellectual or achievement level of an individual and the environmental or external circumstances they encounter. Thus, if level of development,

fostered by home experience, is incongruous with expected performance demanded by the school environment, then those experiences remain unassimilated. Hence, educators and social science researchers are provided with a body of evidence asserting the existence of "no effects from schooling." Hanson (1971) suggests educators assess the degree of discrepancy between home and school environments for the design of educational delivery systems that provide some discernible measure of intellectual growth and achievement. This falls under the rubrics of remediation for experientially deficient children, and acceleration for experientially sufficient children.

Furthermore, evidence presented in this paper should be viewed with respect to the construction and selection of environments capitalizing on the knowledge of the child's past experience. Remarks made by Kessen (1968) on this subject clearly paralleled the research findings of Carew (1975a, 1975b, 1976). The child changes, develops and learns the organization of behaviors in her/his repertoire with aspects of environmental demands or presses. If limitations in early environment exist, the child may experience a low degree of subsequent success in responding to novel problems presented in differing environments. Parents select and construct early environments and experiences in which their children transact. Hence, if they guard against experiential variability, the later selection the child makes in terms of environmental experiences to develop his/her competence may be equally low in variability. Clearly, this suggests a notion of environmental development concurrent with human development, which when taken together, manifests itself as future displays of achievement or intellect in challenging environments, such as the school setting.

DIRECTIONS FOR FUTURE RESEARCH

The introductory propositions derive varying degrees of support from the evidence presented here. In many research instances, the rational and empirical procedures were not directly employed to test these propositions. However, certain relationships among the seemingly diverse pieces of evidence postulate an orderliness, permitting the generation of directions for future research.

Social and psychological processes which provide developmental experiences associated with intellectual and academic performance have been empirically specified in the literature. However, the surface has only been scratched when one considers how these processes are moderated through the child's transactions with her/his environment. These transactional experiences are probably accumulated within a framework for the individual's future use or operation on the environment as an expression of intelligence and learnings.

Consider the notions of sleeper effect (Kagan and Moss, 1962) and cumulative deficit (Deutsch, 1967, Jensen, 1977). The sleeper effect conditions that the manifestation of the impact of early experiences on expression of intelligence does not necessarily appear in the same early developmental period. Rather, environmental-experiential influences have been shown to be more highly correlated with later measures of development. For example, Kagan and Moss (1962) reported that measures of maternal press for the child's achievement taken before age three had higher correlations with the child's achievement behavior during early adulthood or late adolescence. Similarly, the notion of cumulative deficit conditions that deficient, restricted or impoverished early

experience is not immediately associated with poor expressions of intelligence, but accrues in impact through childhood. This effect clearly is reflected in the conclusions of Deutsch (1967) and Jensen (1977), reported above.

These notions and their supporting evidence, when coupled with the findings of Jean Carew (1975a), garner further support for the claims made in the introductory propositions. Recall, that mothers who engaged in activities valued as highly intellectual, essentially fostered the development of competent self-initiated expressions of intelligence in their children, the ability to transact with their environment. The common thread woven in this fabric of environmental evidence is spun around the child's approach to environment as developmental. That is, through experience, whether it be active or passive, the child develops an approach to his/her environment that casts it as alterable or stable with respect to her/his ability to obtain from it novel experiences.

What might be examined is whether or not the child's manipulation of environment, as an expression of intelligence, is associated with intelligence test performance or academic achievement. Similarly, whether slower intellectual growth exists independently of a changing environment or whether a slower rate of development is concomitant to an unchanging environment might be tested. Stated another way, the question to be asked is, does the child's use of her/his environment change and is this associated with changing expressions of intelligence? Further, it seems reasonable to investigate whether or not use of environment manifested in the home or play setting is consistent with early use of the classroom learning environment. What transactive aspects from the home setting are

generalized to the classroom setting? Does the child use the classroom environment for experience in the same manner as she/he uses the home environment for experience?

Research designed to answer the above questions should be viewed as extending the transactional approach of Carew, beyond the developmental stages found in the population of three year olds. Furthermore, it could be argued that such research would tap the reservoir of process variables, typically viewed as parent variables, as mediated by the child and manifested in the child's approach to environment. That is, does the child use the home and school environments similarly along the dimensions of involvement with resources and analytic skills for meeting the challenge of the new environment. Social class and race differences might be investigated in an attempt to identify economic conditions that influence the development of the individual's use of environment. Thus, development may not necessarily be a monotonic function of simply amount and degree of environmental stimulation. Rather, a model for development might include a term expressing degree and amount of environmental change conditioned by the diverse ways in which children come to act on their environments.

Thus, it is postulated that early home experience provides the developing child with a set of assumptions about her/his environment. Such assumptions are expressed through the degree of environmental control exhibited as the child ages. This sense of control might become important in the later use of the classroom for novel and enriching experiences and later expressions of intelligence, through adaptive and responsive behavior.

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